Harm Reduction or Harm Maintenance: Is There Such as Safe Drug Abuse?"
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I. Introduction

Good afternoon. I would like to thank the Committee for the opportunity to speak to you on the important issue of harm reduction programs for the prevention of HIV/AIDS and other blood-borne pathogens spread through unsafe licit and illicit injections in international settings. I would also like to thank the members of this committee for their leadership in bringing attention to the issues before us, including the large and increasing heroin production in Central Asia, specifically Afghanistan.

II. HIV Epidemics in IDU: A Global Problem

There is a growing body of evidence that epidemic spread of HIV infection occurs in tight and complex relationship to heroin trafficking routes.[1,2,3] These relationships are most clearly understood along routes from the two primary illicit opium poppy growing and heroin manufacturing regions of the world: the Golden Triangle of Southeast Asia, and the Golden Crescent of Central Asia. The mechanisms which lead to these HIV outbreaks are just beginning to be understood, as are the special vulnerabilities of communities in trafficking zones to HIV spread. The principal Golden Triangle heroin producers are Burma and Laos, those in the Golden Crescent, Afghanistan and Pakistan. Together, these states account for over 90% of world heroin supplies in 2004.[4] While these top 4 producers generate most of the world's heroin, the HIV epidemics resulting from unsafe injection practices of their product have largely been seen in their neighbors, or in destination markets further afield. For the Golden Triangle, this has meant well documented HIV spread in Burma itself, Thailand, China, India, Malaysia, Vietnam, and, more recently, Indonesia.[5,6,7,8,9,10] For the Golden Crescent, where the data are only now emerging, and where the HIV epidemics are much newer, epidemic spread of HIV and/or hepatitis C appears to be underway in Pakistan, India, Iran, Tajikistan, Uzbekistan, Russia, Ukraine, Belarus, and several states in Eastern Europe.[7,11,12,13,14,15] In virtually all studies that have investigated HIV in IDU in these regions, Hepatitis C, (HCV) if also investigated, is far commoner. HCV prevalence among IDU generally reaches 90% prevalence or higher—a function of the very high transmissibility of this agent through parenteral exposure.

Several consistent features have characterized these Eurasian HIV outbreaks among IDU. *They have been explosive:* HIV prevalence among Bangkok IDU went from 2 to 40% in 6 months in 1989: *They have been transnational;* both China and India have had their highest prevalence zones along their borders with Burma (Yunnan and Manipur States, respectively): they have led to further spread among non-injecting populations, initially sex partners of IDU, as has been documented in Thailand, India, and China: *They have been proven difficult to control;* given government policies toward injection drug use, the status of drug treatment in the affected States, and the limited HIV prevention measures targeted toward IDU.

The third important illicit growing area for poppy is centered in the New World—in Mexico, Columbia, and Peru, and while important for the Americas market, is considerably less well understood in terms of trafficking and HIV spread interactions in the production zones and will not be discussed in detail here, though these areas have clear relevance to the U.S. domestic market in heroin, and in cocaine, and important and commonly injected drug in the Americas.

Licit poppy cultivation for pharmaceutical opiate derivates including morphine, codeine, demerol, and many others, is centered in Tasmania, Australia (about 50% of all licit world production—almost entirely for the analgesic codeine), and in India and Turkey, and has not been associated with heroin production, trafficking, or blood borne infection spread. Opiate derivatives remain an important class of analgesics, and are widely, and generally safely used, with minimal public health effects. What has lead to the "fearful symmetry" of heroin trafficking and HIV spread is the illicit nature of criminal production and distribution, and the rapid uptake of heroin use, injection, and unsafe equipment use by young people in vulnerable communities along trafficking routes and in destination markets further afield.

How compelling are the existing data on the relationships between heroin trafficking and HIV? What do we know about the mechanisms of spread? What tools are available to policy makers, governments, clinicians, and others to understand these relationships, and to respond to them? And finally, why have societies from Ukraine to Vietnam been so vulnerable to these interactions--and what can be done to reduce the growing harm?

III. Heroin Economies

The Golden Crescent: HIV infection rates and Central Asian heroin

We know considerably less about both heroin and HIV epidemics in the Golden Crescent than we do about South and Southeast Asia. For most states affected by Afghani and Pakistani heroin, HIV spread is a more recent event, and many states have little data or research capacity. Still, what we do now know suggests another region of fearful symmetry.

Poppy production can be measured with several tools, arguably the most accurate is Landsat satellite technology, which measures crop densities.[4] US intelligence agencies have used Landsat to assess poppy cultivation, estimate opium base harvests, and to calculate heroin yields (ten kilos of opium base gives roughly one of refined heroin). In 1996, after the establishment of Taliban rule in Afghanistan, the estimated yields were 200 tons from Afghanistan.[4] By 1999, Afghanistan was producing 450 metric tons of heroin per year, and had become the world's largest single producer in a multi-billion dollar industry. Poppy growing appeared to cease in 2000 with the edict of then leader Mullah Muhammed Omar, but stockpiled heroin reserves held by producers and traffickers apparently insured that actual supply was maintained despite the growing ban. In 2002, the new Kabul administration and its allies acknowledged that reducing poppy cultivation will require a long term process of agricultural reform and development, as well as the extension of government control across the vast rural areas of the country. For the short to medium term at least, the Afghanistan will remain a significant producer. In the 2003-2004 period, Afghan poppy cultivation and heroin production have substantially increased, with a 64% estimated increase in acreage under cultivation, and a 900 ton increase, to 4200 metric tons, in output, according to the UNODC.

The second largest grower in the region, Pakistan, producers about 20 metric tons of heroin a year, roughly on the level of Laos, and mostly in the remote tribal zones along in Afghan border in Pakistan's Northwest Frontier Provinces.[4] These areas are only marginally under federal control, very underdeveloped, and likely to remain dependent of poppy cultivation for some years.

The HIV outcomes of heroin exports from Afghanistan and Pakistan are only beginning to be understood, and are rapidly changing as nascent HIV epidemics take hold in a region which has appeared to be relatively spared from HIV, and for which data have been sparse. Pakistan and Iran appear to be two of the major overland routes for trafficking of Afghani heroin.[7] While both are low HIV prevalence states, Pakistan had an estimated 3 million heroin addicts in 2000, and has suffered great social harms as a consequence.[11] Iran led the world in 1999 in narcotics seizures by volume.[4] And Iran also and has an

enormous epidemic of heroin use among its young people.[7] The Teheran regime is deeply concerned about this, and it was a primary source of tension and border conflict with the previous Taliban regime. A nascent epidemic of HIV among Iranian IDUs appears to have begun in 2000-2001, with recent reports of very high rates of HIV infection among incarcerated IDU in Teheran, up to 67% in one facility.[7]

No countries appear to have been more affected, however, than Russia and its two former Republics, Ukraine and Belarus.[12, 14] UNAIDS in its year 2004 Report on the Global Pandemic identified the these three states as having the fastest growing HIV epidemics worldwide; and more than 75% of all infections in Russia and its neighbors in 2000 were due to injecting drug use.[12, 13, 26] The Russian Far East has been particularly affected. The Irkutsk region, around Lake Biakal in Siberia, has the highest HIV infection in the Russian Federation (Moscow is first) and again, more than 80% of reported HIV infections in Irkutsk have been among IDU.[27] Kazakhstan too, has seen a recent outbreak of drug use and HIV infection, although whether the trafficking route comes from China to the East or Afghanistan to the south is unclear.

Poppy Cultivation and Politics:

While the HIV epidemic represents a new challenge to Russia, the Golden Crescent trafficking connections are not new. This situation also prevailed during the long Afghan war with the then USSR, when poppy cultivation by the Mujahadeen was tolerated by the West, and the US, recognizing that the anti-Soviet forces had no other exports of comparable value and ease of transport to heroin.[28] High rates of heroin use and addiction among Soviet forces in the Afghan conflict were a predictable outcome, and helped (as in the U.S. conflict in Vietnam) undermine support for the war among troops, their families, and Soviet citizens.

Afghanistan's poppy farmers then and now are largely subsistence farmers, selling opium as a cash crop to supplement minimal incomes. As prevails in the Golden triangle region, the real profits of heroin are not in farming, but in trafficking, and it is the trafficking networks where real revenues accrue.[28] But part of the legacy of war has been local expertise in poppy growing, narcotics production and sales. The Afghan war, which the Soviets lost, appears to have brought heroin first to dispirited troops, and then to Moscow, such that trafficking links too, may be a legacy of the long struggle of the Afghani people although this, for now, must remain speculation.

Further west, China is currently undergoing another heroin-related epidemic. The Xinjiang Uighur's People's Autonomous Region is China's only Muslim majority region. Xinjiang shares borders with Afghanistan, Kazakhstan, Russian Siberia, Tibet, and internal borders linking it by the Silk Road to China Proper. It also has China's second highest rate of HIV infection by province, after Yunnan in the far south.[20] And more than 78% of infections in Xinjiang have been due to injection drug use involving heroin. Tragically, more than 90% of injections in the two largest cities in Xinjiang are ethnic Uighurs—and so HIV infections in this large province are largely among young Muslims.[9]

China, Russia, Ukraine, Belarus, Kazakhstan, Pakistan, and Iran, are all experiencing heroin use outbreaks among their young people, and all now appear to have HIV epidemics related to this use. Heroin exports from the Golden Crescent are at the root of these complex new problems. These are regional challenges—but they point to a global problem which ties the Crescent to the Triangle—illicit heroin revenues. On paper, Afghanistan was the world's poorest state in 2000; Burma, a UN "Least Developed Country." Afghanistan is almost entirely dependent on donor aid in 2004, and has essentially no foreign reserves, a bankrupt treasury, and limited licit exports. We do not know the details economics of the trafficking networks based in the Golden Crescent—but we do know that taxes on poppy farmers and protection money from traffickers were among the main sources of revenue for both Taliban and the Northern Alliance before the current regime came to power. In both Burma and Afghanistan, heroin has allowed for black market weapons purchases to fund militias, insurgencies, and crime.[4] Afghanistan has the potential to grow other crops, including grain and orchard production, but these require irrigation systems, which have

largely been destroyed, and access to markets, which remains a huge challenge for much of the country. Burma's growing regions have been at war with the Central Government roughly since the departure of the British after WWII.[29] Reducing the opium supply from these regions will require establishing viable alternative economies for the rural poor—and that will take time, sustained donor investment, and the growth of stable functioning civil societies. Should Afghanistan descend again in civil strife and warlordism, heroin production will likely rise again. Indeed, as in Burma, it is in the interests of the narcotics cartels and the corrupt leaders they have supported that civil society fail—a chilling reality given the wealth, power, and weapons, heroin revenues have already generated.

Mechanisms on the ground

Before considering policy responses to the interactions of heroin and HIV, there are some mechanisms of these interactions which bear on HIV spread and how best to curtail it. One obvious feature shared by all of the primary trafficking zones out of the Triangle and the Crescent is geographic: overland heroin is moved almost exclusively across remote border regions; generally mountain and forest zones adjacent to the hills where poppy will grow. The illegal and clandestine nature of this industry demands such remote areas. Indeed, as former UNDCP Director Pino Arlacci has pointed out, there are very few regions remote and lawless enough to support a major heroin industry. It is surely no coincidence that secretive, closed and junta-run Burma; isolated Laos under its Communist Party; Afghanistan in its decades of strife, and the tribal zones of Pakistan, should be the world's leaders in heroin production. Absent a few other states, these are among the only places in the world closed enough to sustain the heroin industry.

A second shared feature is ethnicity. These areas generally have in common populations who are ethnic minorities and/or tribal groups.[29] In Southeast Asia they are virtually all dwellers of the hills, where the majority populations, the Thais, Laos, Burmans, and Vietnamese are lowlanders and rice cultivators.[29] An especially important factor is these groups tend to straddle national borders. So in Yunnan, both sides of the China-Burma border lands are farmed by ethnic Kachin and Wa—not Han Chinese or Burmans, and family, language, and trade links long predate heroin trafficking. Another example is the ethnic Manipuris of Manipur, who are Tibeto-Burmans, as are the Burmese, and are not ethnic Indians, and who can move easily into Burma to access the heroin markets in Mandalay.[30]

For HIV to spread along trafficking routes, local people have to use the drugs. Qualitative work in China, India, Burma, and Vietnam has suggested a direct mechanism for the "exchange" of HIV-1 subtypes (known as clades or strains). This mechanisms relies on the fact that many petty traders in the region are also users, who support their own habits by purchasing and selling small amounts of heroin. In at least 4 states, we know that these petty traders typically self-test heroin purity by injecting themselves. Since travelling across these zones with injecting equipment is an obvious sign of intent to use, they virtually never have their own equipment. On the China—Vietnam border, for example, traders typically cross the mountains from China, stay the night with their contacts in Vietnam, and share drugs and equipment before making purchases. The very low genetic diversity of strains in this region suggests rapid spread of only viral subtype, a molecular feature favored by this kind of direct spread. Major traffickers moving heroin by the hundreds of kilos or more have very different ways to move product, including trucking, sea, and air routes. But it is likely that HIV spread in overland regions is a more local person-to-person event, albeit one with wide consequences. A recent report from Yunnan, indeed, found that 75.9% of a large series of IDU in southeastern Yunnan were Han Chinese ethnicity.[31] The authors concluded that "…the epidemic in Yunnan is no longer confined to non-Han ethnic minorities."

A fourth mechanism is likely to important as well, though somewhat variable. Along at least some of the major trafficking routes, overland trucking routes have led to the development of services for truckers. In addition to fuel, food, and lodging, these often include sex services. In Southeast Asia these sex services are generally roadside brothels, karaoke parlors, bars and the like. In Central Asia they may be less

apparent, but still available, or may have young male sex workers, as in the Pakistani trucking industry. These border zone sex service venues can overlap with drug trafficking, and provide another mechanism by which HIV could spread where heroin, and other contraband are moved. On the Burma—Thai and Burma—China borders, women and girls are trafficked on the same routes, and indeed by some of the same trafficking networks, as heroin.[32]

The interaction of heroin trafficking and sex industry related HIV risks can also be found in the special economic zone of Pingxiang City on the highway and train crossing from Vietnam to China.[1] Pingxiang was one of the first Chinese cities to experience a rapid HIV epidemic among IDUs, and molecular work has confirmed the cross-border nature of this epidemic.[5] But Pingxiang also has a booming sex trade on the Chinese side of the zone. We enumerated 19 separate brothels in a four street radius in the trucking zone in Pingxiang in 2000, each with 10-30 women and girls working. HIV rates have remained low among these women until 2001, though there now appears to be increasing prevalence.[33] In settings like Pingxiang, sex workers and their clients in border and trafficking zones may be key "bridge" populations from IDU to wider networks of people at sexual risk.

Policy Responses

Why have IDU outbreaks associated with heroin trafficking proven so difficult to prevent or control? In the major production zones, and in the wider affected regions, treatment and prevention programs for drug use were limited before HIV spread.[34] This remains largely the case—across the whole of Asia the only place where evidence based heroin treatment and methadone maintenance are available on demand to drug users in Hong Kong. This is tragic, given that there is a large and growing international evidence base for success in prevention of HIV infection and other blood-borne diseases among IDU.[36] While the majority of published reports have been from the developed world, principally Western Europe, Australia and North America, there have been several reports of pilot projects and/or successful programs in Asia; including reports from Thailand, Nepal, India, and Vietnam. Much of this work has focused on harm reduction, and needle and syringe exchange programs, the basic tools of most reported interventions. The Journal of Substance Use and Misuse published its "Bibliography on Syringe-Exchange References" in 1998—which includes several hundred published reports on these interventions and the debates which they have generated.[37]

Well-described and successful needle exchange programs (NEP) include those in the Netherlands, Australia and the UK. In the largest analysis published HIV incidence increased by about 6%/year in 52 cities without NEPs, and decreased by 5.8%/year in 29 studied cities with NEPs.[38] The New York City NEPs have been studied in prospective cohorts: lower rates of incident HIV infection were documented among IDU using NEPs (1.4-1.6%/year) than among those who did not attend NEPs (5.3%/year, 95% confidence interval: 2.4-11.5)[39] Long term methadone maintenance therapy (MMT) has been shown to reduce HIV risk behaviors, particularly needle-use, and there is strong evidence that MMT prevents HIV infection among IDU.

Where harm reduction and MMT are available, as they were to many US IDU in the HIVNET vaccine preparedness studies (VPS), sero-incidence can be low.[40] In this study HIV incidence among gay and bisexual men from 1995-1997 was measured at 1.55/100PY, while among male IDU, the rate was 0.38/100PY.

The Thai Epidemiology Working Group has recently published projected scenarios for the Thai epidemic.[41] They found that a decline in needle sharing from 20% to 10% among Thai IDU (a 50% reduction in these behaviors) would avert 21,774 new infections by 2006, and 81,761 infections by 2020. This would constitute the single largest number of infections averted for any one intervention strategy. By 2006, roughly 3,800 of the expected 22,000 infections nationwide would be averted by this intervention alone.

Vietnam has reported on the feasibility of NEPs and on pilot NEPs in Hanoi and Ho Chi Minh cities.[42] While they did not measure impact, they were able to conclude that NEPs were feasible, but that they required community acceptance, and acceptance from the police, to be sustained. NEPs have also been implemented in India, notably in New Delhi and Manipur State, where high rates of IDU behavior are common.

Taken together, these studies all support that harm reduction and NEPs are effective prevention tools, and that they might have an impact in heroin related epidemics in trafficking zones. Why then, have these approaches been so little used in the fight against HIV/AIDS?
It is difficult to imagine a public health tool with reasonable evidence of efficacy which has generated as much debate as have prevention programs for IDU. A review of the literature suggests 3 principal problems with the implementation of harm reduction approaches and NEPs.[43, 44] First, they have repeatedly been seen as condoning or facilitating injection drug use, making them politically unpopular beyond the prevention community. Second, they have faced legal, security, and policy challenges since they require "safe" domains of interaction with active IDU. A third challenge, where NEPs have been implemented, is coverage rates of NEP for IDU populations, largely driven by limited resources.

Conclusions

Individual, communities, and countries which have the misfortune to be on major heroin trafficking routes face multiple epidemics in 2005. These epidemics begin with heroin use, heroin injection, and then HIV infections. While a clear long-term goal for all these states is to be free of drug trafficking, the realities of the current political and development situations of the major producers, most notably Burma and Afghanistan, suggest that narcotics-based economies will be with the world for some time. In the short to mid term, a public health based approach would be to minimize the health impacts of heroin trafficking, specifically through working with affected communities. Such approaches could include reducing heroin addiction through improved treatment and support for IDU, and reducing HIV spread among those who continue to inject through expanding harm reduction and needle and exchange programs. The prevention of spread beyond IDU alone suggests that this may be critically important to the prevention of wider epidemics of HIV/AIDS. A clear priority for further research and programs are the frontline Central Asian states in the Golden Crescent: Iran, Tajikistan, Kazakhstan, Pakistan, and others. These must be considered very high risk states for explosive spread of HIV in the coming years, and could benefit from the programmatic and research experience that have elucidated the heroin and HIV interactions of the Golden Triangle. These Central Asian States currently have the greatest discrepancy between HIV vulnerability (extremely high) and prevention preparedness among IDU (very low). Without substantial donor support for HIV Prevention and drug treatment for drug users, Central Asia will likely face a devastating epidemic of HIV/AIDS in the coming years. Now is not the time to limit any known prevention approach for this crucial region.

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